

Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A switchable optical unit (~~1; 50; 200; 501; 1501~~) capable of controlling an external beam of radiation (b) passing through an optically active portion (~~8; 108; 408; 1408~~) of the unit,

wherein the optically active portion comprises a region through which the beam of radiation passes through the switchable optical unit, which unit comprises a chamber (~~10; 110; 410; 1410~~) and an electrically conductive liquid (~~18; 118; 218; 418; 1418~~) contained in the chamber,

the chamber being provided with an electrode configuration (~~20, 22, 24, 28; 120, 122, 124, 128; 220, 222; 509, 510, 514~~) wherein application of a voltage (V), from a voltage control system (~~30, 32, 34, 36, 38, 40, 41, 42; 130, 132, 134, 136, 138, 140, 141, 142; 430, 432, 434, 436, 438, 440, 442~~) to electrodes causes movement of the said liquid, characterized in that the electrode configuration comprises:

at least one first electrode (~~20, 22; 120, 122; 220, 222; 509~~) fixed to the inner walls (~~12, 14; 506, 508~~) of the chamber at the position of the optically active portion (~~8; 108; 408~~),

second electrode means (~~24; 124; 510~~) fixed to the inner walls of the chamber at positions outside the optically active portion and a third electrode (~~28; 128; 514~~) in contact with the conductive liquid and continuously connected to a first output (~~32; 132; 432~~) of a voltage source (~~30; 130, 430~~), a second output (~~34; 134; 434~~) of which is connected

in a first mode to said at least one first electrode and in a second mode to the second electrode means, and

wherein in a first mode, the electrically conductive liquid fills the chamber inside the optically active portion, and

wherein in a second mode, the electrically conductive liquid fills the chamber outside of the optically active portion.

2. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein the second electrode means (24; 124; 510) includes one annular electrode having a U-shaped cross-section.

3. (Original) A switchable optical unit as claimed in claim 1, wherein the second electrode means includes one flat annular electrode.

4. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein the interior wall (12, 14; 506) of the chamber facing the liquid is coated with an insulating hydrophobic layer (44; 144; 513).

5. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein the chamber comprises a medium (19; 119; 219; 419; 1419) contained in the chamber which has an index of refraction different from that of the conductive liquid (18; 118; 218; 418; 1418).

6. (Currently Amended) A switchable optical unit as claimed in claim 5, wherein the medium (19; 119; 219; 419; 1419) is a liquid.

7. (Currently Amended) A switchable optical unit as claimed in claim 5, wherein the medium (19;119; 219; 419; 1419) is a gas.
8. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein a liquid free portion of the chamber (10; 110; 210; 410; 1410) is at vacuum.
9. (Currently Amended) A switchable optical unit as claimed in claim 1, comprising at least one lens element (2, 4) wherein at least one chamber wall (12, 14) situated in the optically active portion (8) includes a refractive lens surface.
10. (Currently Amended) A switchable optical unit as claimed in claim 9, wherein each of two opposite chamber walls (12, 14) situated in the optically active portion (8) includes a refractive lens surface.
11. (Currently Amended) A switchable optical unit as claimed in claim 9, wherein at least one of the refractive lens surfaces (12, 14, 46, 48) is an aspherical surface.
12. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein at least one chamber wall (56; 78) situated in the optical active portion (108) is provided with a phase structure (58, 60; 202).

13. (Currently Amended) A switchable optical unit as claimed in claim 12, wherein the phase structure is a non-periodical structure (202), which renders the unit to a wavefront-modifying unit

14. (Currently Amended) A switchable optical unit as claimed in claim 12, wherein the phase structure is a periodical structure (58, 60).

15. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein the voltage control system (30, 32, 34, 36, 38, 40, 41, 42; 32, 134, 136, 138, 140, 141, 142) is arranged to supply a voltage to the at least one first electrode (20, 22; 120, 122; 220, 222) individually.

16. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein the index of refraction of the electrically conductive liquid (18; 118; 218) is equal to that of the optically relevant material of the chamber wall (12, 14; 112, 114).

17. (Currently Amended) An optical camera (300) including a controllable lens system, wherein the lens system (1; 302) comprises a switchable optical unit as claimed in claim 1.

18. (Currently Amended) A hand-held apparatus including an optical camera (300) as claimed in claim 17.

19. (Currently Amended) A switchable optical unit as claimed in claim 1, wherein at least one chamber wall (506, 508) situated in the optically active portion (408) includes a planar surface.

20. (Currently Amended) A switchable optical unit as claimed in claim 19, wherein each of two opposite chamber walls (506, 508) situated in the optically active portion (408) includes a planar surface.

21. (Currently Amended) An optical head (360) for scanning an information layer (354) and comprising:

a radiation source unit (362) for supplying a scanning beam (364, 374),
an objective system (370) for focusing the scanning beam (374) to a scanning spot (380) in the information layer and;

a radiation-sensitive detection unit (384) for converting scanning beam radiation (390) from the information layer in electrical signals,
the radiation source being switchable to emit a read beam and a write beam respectively,

wherein the optical head comprises a diffraction element (392) for both the read beam and the write beam in the form of a switchable grating unit (50) as claimed in claim 14.

22. (Currently Amended) An optical head (360) for scanning an information layer (354) and comprising:

a radiation source unit (362) for supplying a scanning beam (364, 374)

an objective system (370) for focusing the scanning beam (374) to a scanning spot (380) in the information layer (354) and;

a radiation-sensitive detection unit (384) for converting scanning beam radiation (390) from the information layer in electrical signals,

the radiation source being switchable to emit a read beam and a write beam respectively,

wherein the optical head comprises a diffraction element (392) for the read beam only in the form of a switchable grating unit (50) as claimed in claim 16.

23. (Currently Amended) An optical head (360) for scanning an information layer (354) and comprising:

a radiation source unit (362) for supplying a scanning beam (364, 374),
an objective system (370) for focusing the scanning beam (374) to a scanning spot (380) in the information layer and;

a radiation sensitive detection unit (384) for converting scanning beam radiation (390) from the information layer in electrical signals,

the radiation source unit emitting at least two scanning beams of different wavelengths for scanning at least two information planes of different formats,

wherein the optical head comprises a beam deflecting element in the form of a switchable phase structure (50) as claimed in claim 16 to align the axis of the at least two beams having different wavelengths.

24. (Currently Amended) An optical head (360) for scanning an information layer (354) and comprising:

a radiation source unit (362) for supplying a scanning beam (364, 374),
an objective system (370) for focusing the scanning beam (374) to a scanning
spot (380) in the information layer and;
a radiation-sensitive detection unit (384) for converting scanning beam
radiation (390) from the information layer in electrical signals,
the radiation source emitting at least two scanning beams of different
wavelengths for scanning at least two information planes of different formats,
wherein the optical head comprises a three-spot grating (392) in the form of a
switchable phase structure (50) unit as claimed in claim 14.

25. (Currently Amended) An optical head (360) for scanning an information layer (354) and
comprising:
a radiation source unit (362) for supplying a scanning beam (364, 374),
an objective system (370) for converging the scanning beam (374) to a
scanning spot (380) in the information layer and;
a radiation-sensitive detection unit (384) for converting scanning beam
radiation (390) from the information layer in electrical signals,
the radiation source emitting at least two scanning beams of different
wavelengths for scanning at least two information planes of different formats,
wherein the objective system comprises in addition to a refractive lens system
(370) a wavefront-modifying unit (368) in the form of a switchable phase structure unit (50);
200) as claimed in claim 14.

26. (Currently Amended) An optical head (360) as claimed in claim 25, wherein the wavefront-modifying unit (50; 200) is incorporated in the refractive lens system (370).

27. (Currently Amended) An optical head (360) for scanning a format having a first information layer (522) in an information plane and a second information layer (524) in a different information layer plane,

said optical head comprising:

a radiation source unit (1362) for supplying a scanning beam (1364, 1382),

an objective system (525) for focusing the scanning beam (1364, 1382) to a scanning spot (1380) in one information layer and;

a radiation-sensitive detection unit (384) for converting scanning beam radiation (1390) from the one information layer into electrical signals,

wherein the objective system comprises a switchable optical element (501; 1501) as claimed in claim 20 for switching the scanning spot between the first and second information planes.

28. (Currently Amended) A switchable optical unit (1; 50; 200; 501; 1501) capable of controlling a beam of radiation (b) passing through an optically active portion (8; 108; 408; 1408) of the unit, which unit comprises:

a chamber (10; 110; 410; 1410) and an electrically conductive liquid (18; 118; 218; 418; 1418) contained in the chamber and having an index of refraction different from that of its surroundings, the chamber being provided with an electrode configuration (20, 22, 24, 28; 120, 122, 124, 128; 220, 222; 509, 510, 514) wherein application of a voltage (V),

from a voltage control system (30, 32, 34, 36, 38, 40, 41, 42; 130, 132, 134, 136, 138, 140, 141, 142; 430, 432, 434, 436, 438, 440, 442) to electrodes causes movement of the said liquid, characterized in that wherein the electrode configuration comprises:

at least one first electrode (20, 22; 120, 122; 220, 222; 509) fixed to the inner walls (12, 14; 506, 508) of the chamber at the position of the optically active portion (8; 108; 408),

second electrode means (24; 124; 510) fixed to the inner walls of the chamber at positions outside the optically active portion and;

a third electrode (28; 128; 514) in contact with the conductive liquid and continuously connected to a first output (32; 132; 432) of a voltage source (30; 130; 430), a second output (34; 134; 434) of which is connected in a first mode to said at least one first electrode and in a second mode to the second electrode means,

wherein at least one chamber wall (56; 78) situated in the optical active portion (108) is provided with a phase structure (58, 60; 202).